

## chapter eight

# Lighting & Flash

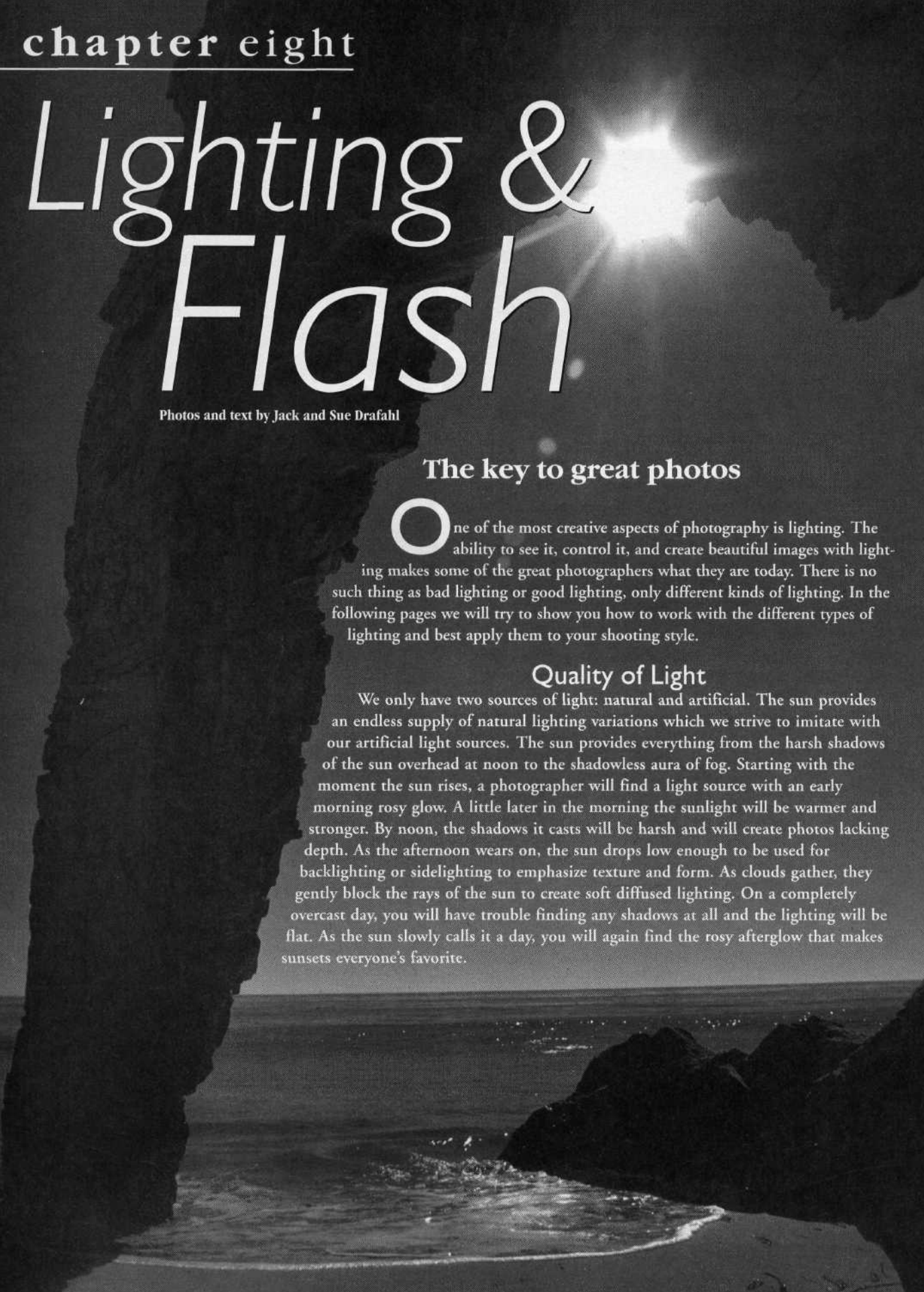
Photos and text by Jack and Sue Drafahl

### The key to great photos

One of the most creative aspects of photography is lighting. The ability to see it, control it, and create beautiful images with lighting makes some of the great photographers what they are today. There is no such thing as bad lighting or good lighting, only different kinds of lighting. In the following pages we will try to show you how to work with the different types of lighting and best apply them to your shooting style.

### Quality of Light

We only have two sources of light: natural and artificial. The sun provides an endless supply of natural lighting variations which we strive to imitate with our artificial light sources. The sun provides everything from the harsh shadows of the sun overhead at noon to the shadowless aura of fog. Starting with the moment the sun rises, a photographer will find a light source with an early morning rosy glow. A little later in the morning the sunlight will be warmer and stronger. By noon, the shadows it casts will be harsh and will create photos lacking depth. As the afternoon wears on, the sun drops low enough to be used for backlighting or sidelighting to emphasize texture and form. As clouds gather, they gently block the rays of the sun to create soft diffused lighting. On a completely overcast day, you will have trouble finding any shadows at all and the lighting will be flat. As the sun slowly calls it a day, you will again find the rosy afterglow that makes sunsets everyone's favorite.





Right: A full overcast evens out the lighting and reduces contrast, so you get good detail throughout the image. But you need a faster film because of the lower light level.

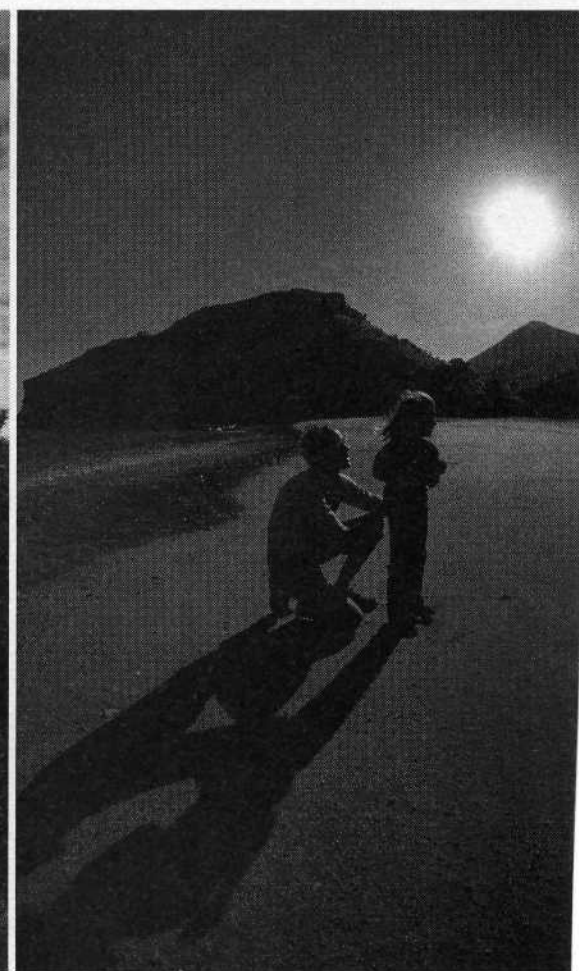
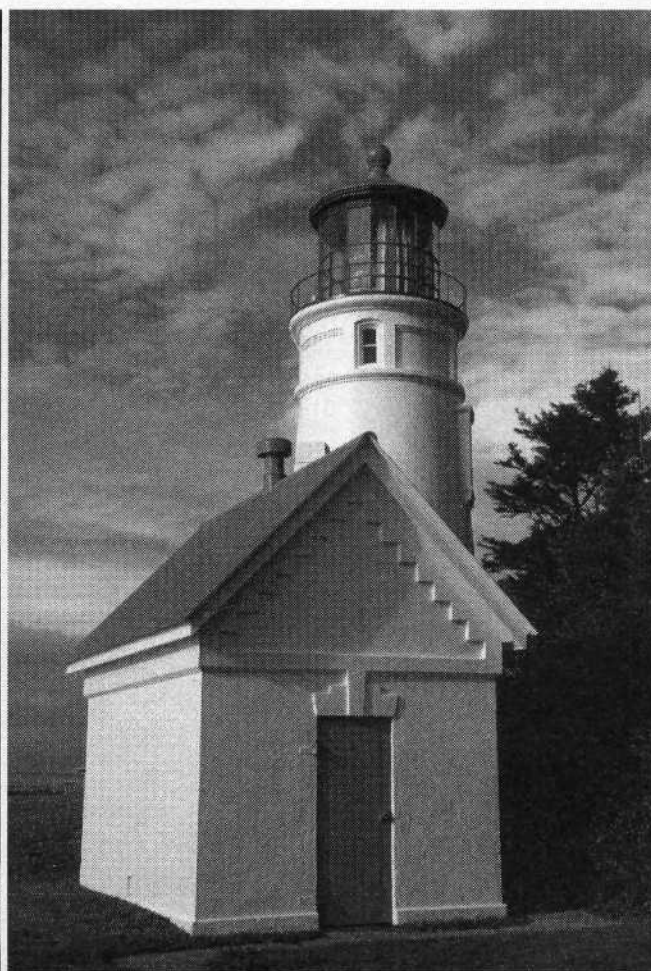
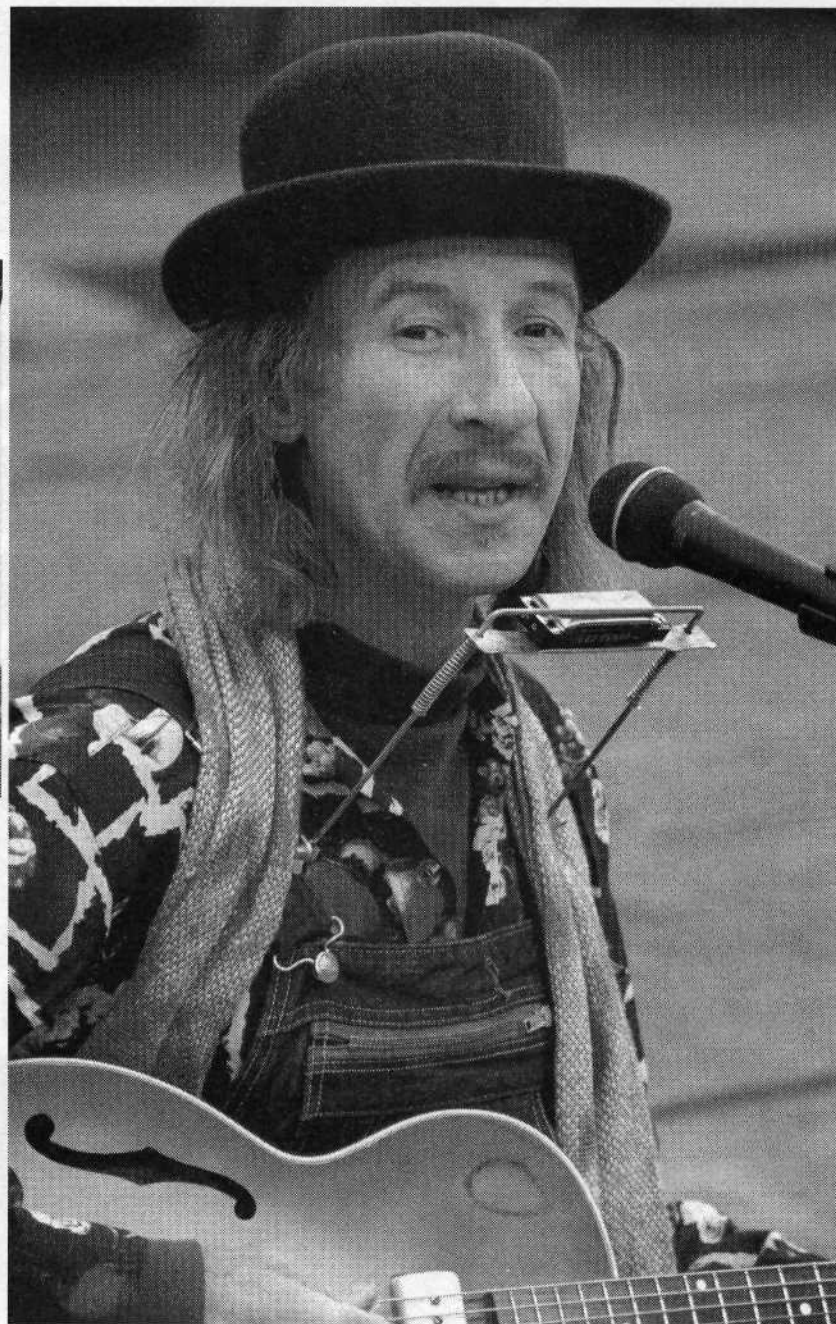
Below: Direct sunlight is harsh and contrasty, producing stark highlights and dark shadows. Such lighting is bright, so you can use a slow, fine-grain film, but not ideal for all subjects.



## Direction of Light

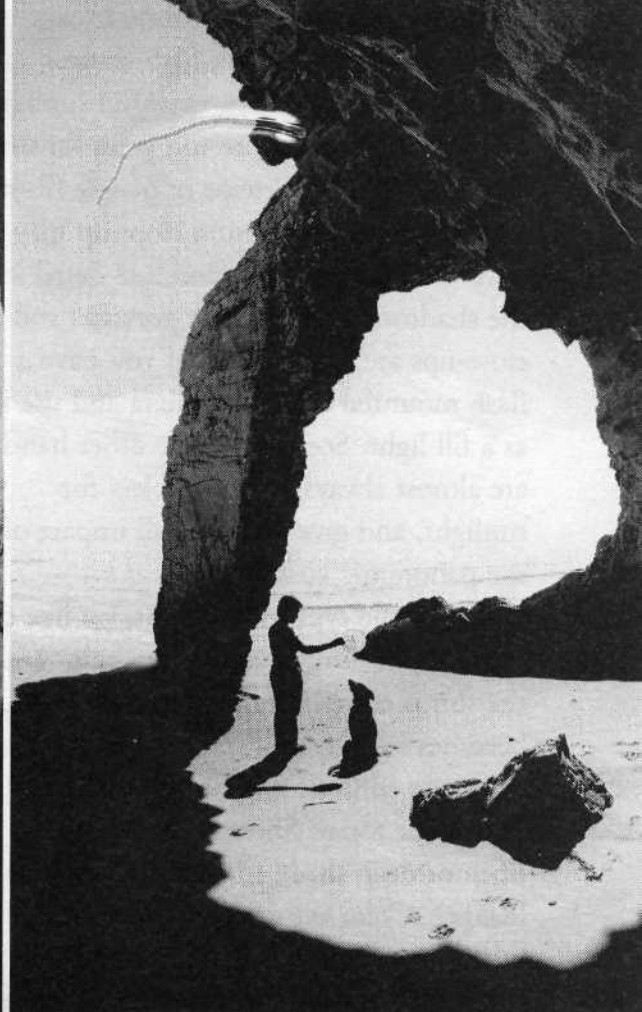
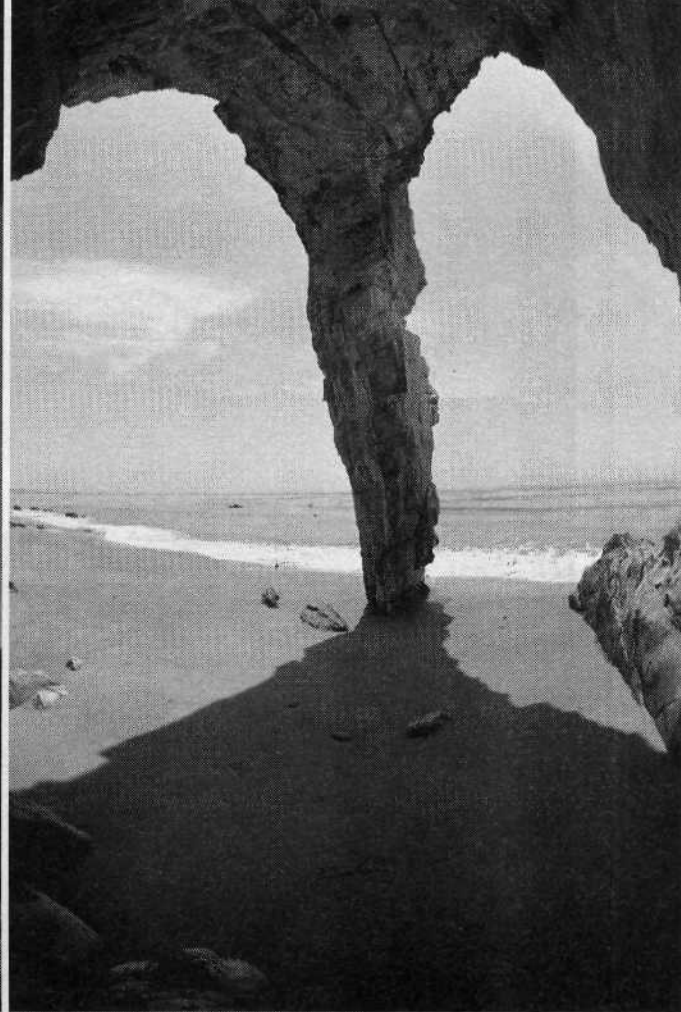
As a single light source moves around a subject, it takes on a new feel. In each case the direction of light will cause a different type of emotion. In sunlight, photographers either move subjects or wait until the sun moves to the right position to get different lighting angles. In the studio, it is a simple matter of moving the lights until the desired effect is produced.

Front lighting strikes the subject straight on and provides a stark, flat effect. Very little depth is derived from front lighting. As the light moves to a 45° angle from the



Left: Front lighting is good for record shots, but not terribly dramatic. Built-in flash units produce front lighting. Center: Sidelighting provides a feeling of depth, emphasizing form and bringing out the subject's texture. Right: Backlighting can be very dramatic, but also can fool built-in exposure meters. Bracketing is a good idea.





subject, you start to pick up depth and shape. When the light moves to the side, the shape and depth of the subject become exaggerated, but detail in some of the shadows becomes lost. You can also vary the side lighting by moving it to the top of the subject for a completely different feel. Finally, as the light moves to the backlight position, you change to a silhouette image.

Each direction of light serves a purpose in your end photo. A photojournalist who is trying to depict a stark-looking scene may use all front lighting to accomplish that effect and flatten the image. A portrait photographer may use side and 45° light to give depth or exaggerate a person's attributes. A nature photographer may only work in the early and late hours of the day to capture the warmth of the day on film.

## Quantity

The quantity and quality of light both have very similar sounding names, but are very different in application. The more light you have, the easier it is to capture subjects on film. As your light source gets brighter, you can use slower films for finer-grained pictures. Or you can use faster shutter speeds to stop the action, or smaller lens apertures for more depth of field. Low-light situations can still be captured on

Outdoors, you can't easily and quickly move your light (the sun) as you can in the studio. But by moving around the subject and shooting at different times of day, you can get a great variety of lighting. Top left: Shooting into the sun. Top center: Under the arch with sun overhead. Top right: Backlighting with subject under arch. Above: Flat front lighting with the sun behind the camera lacks drama, but records good detail throughout the scene.

film, but it takes lenses with large apertures, long exposures and higher-speed films.

## Variations of Sunlight

Sunlight comes in a variety of flavors. One of the best ways to manipulate full sunlight is by moving around the subject, changing your point of view. If it means a little extra physical effort to get a better lighting position, it may well be worth it.

New photographers usually make the assumption that full

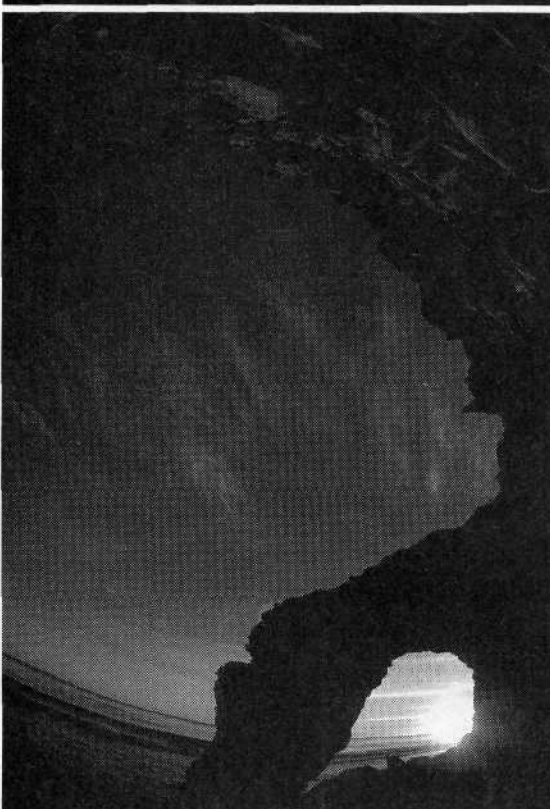
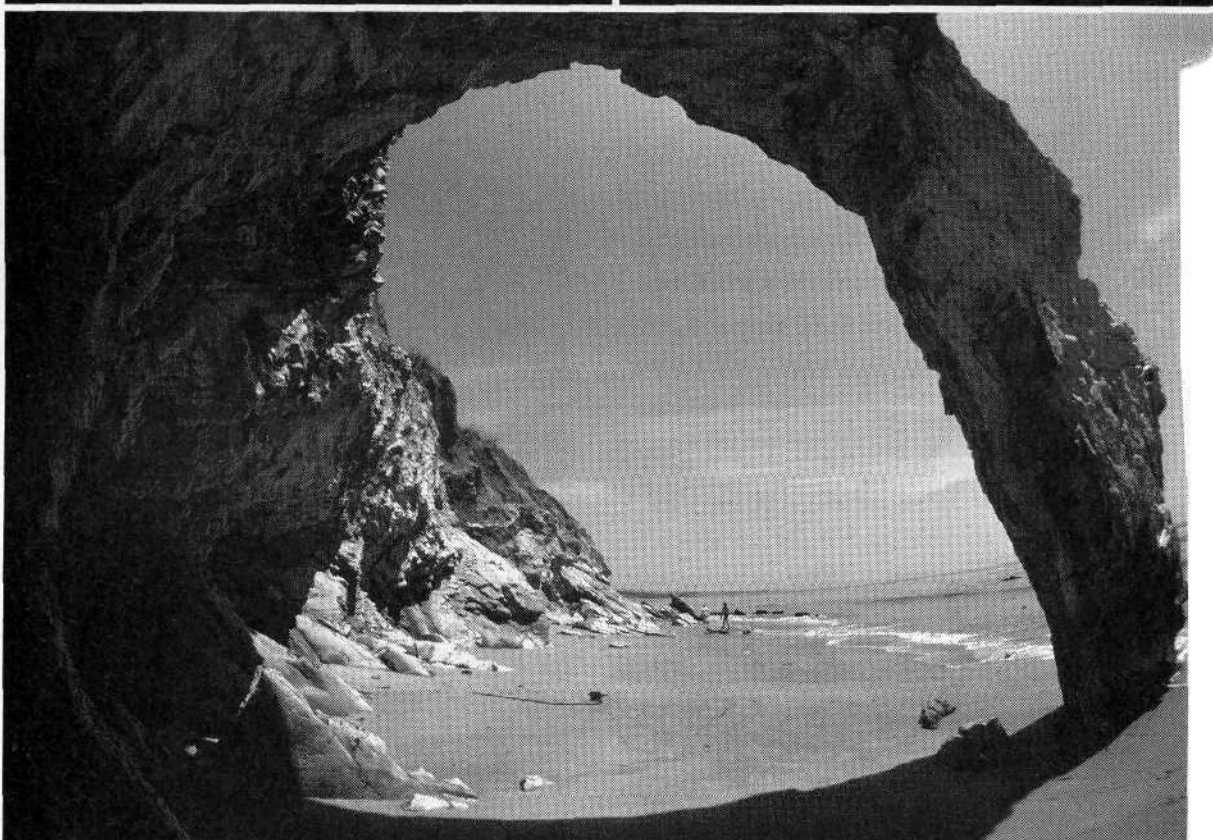
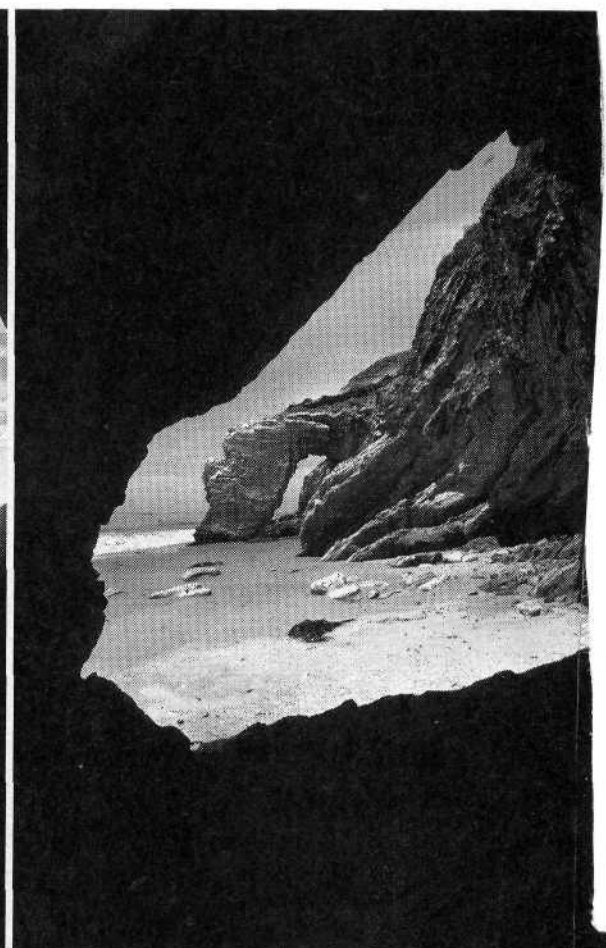


sunlight is always the best time to take pictures. It's easier to get high shutter speeds and small apertures in full sunlight, but the contrast may be too great for some types of pictures. Groups of people from a distance work great, but a close-up may have too much contrast, and lose detail in the shadows. Full sunlight portraits and close-ups are better suited if you have a flash mounted on your camera and use it as a fill light. Scenics, on the other hand, are almost always a good subject for sunlight, and give you the full impact of the panoramic views.

Of all the types of sunlight, we like the soft light of heavy overcast the best. When the sun is completely behind the clouds, it becomes very neutral in color balance, and the scene contrast will fit on most every film made today. Shots taken out in the open or deep shade all have the same color balance. Color saturation is now at its maximum, and objects with round surfaces have excellent detail in the deepest shadows. The drawback is that the lower light levels mean slower shutter speeds, and larger apertures. You can compensate for this by using one of the new fine-grain high-speed films on the market. The ISO 400 films look great in overcast lighting as they have slightly more contrast than other films. If the lighting is really flat, there are films with extra color saturation that will enhance this lighting even more. If you have waterfalls in your area, this is the best kind of lighting to enhance their beauty. You will need a tripod as you will want to stop the camera lens all the way down, allowing for long exposures to blur the water.

Even on sunny days, you can take photos of your subject in full shade. This presents a major problem as the majority of the light falling on your subject comes from the blue sky. This indirect lighting from the sun will have a much stronger blue cast and will color-shift slide film. Correction of this blue cast can be accomplished with one of the 81-series warming filters, but unfortunately one filter cannot correct all situations. We realize that it can get expensive buying the entire set, so we recommend that you start with the 81C correction. If you use color negative film, the correction will be made during printing, so this is only a problem for photographers using slide film.

One step beyond heavy overcast is fog.



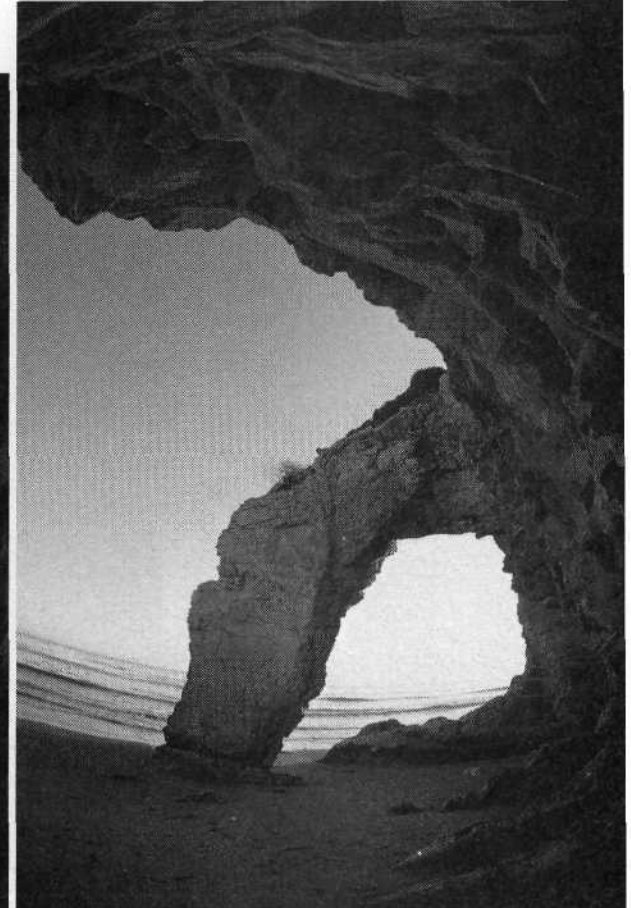
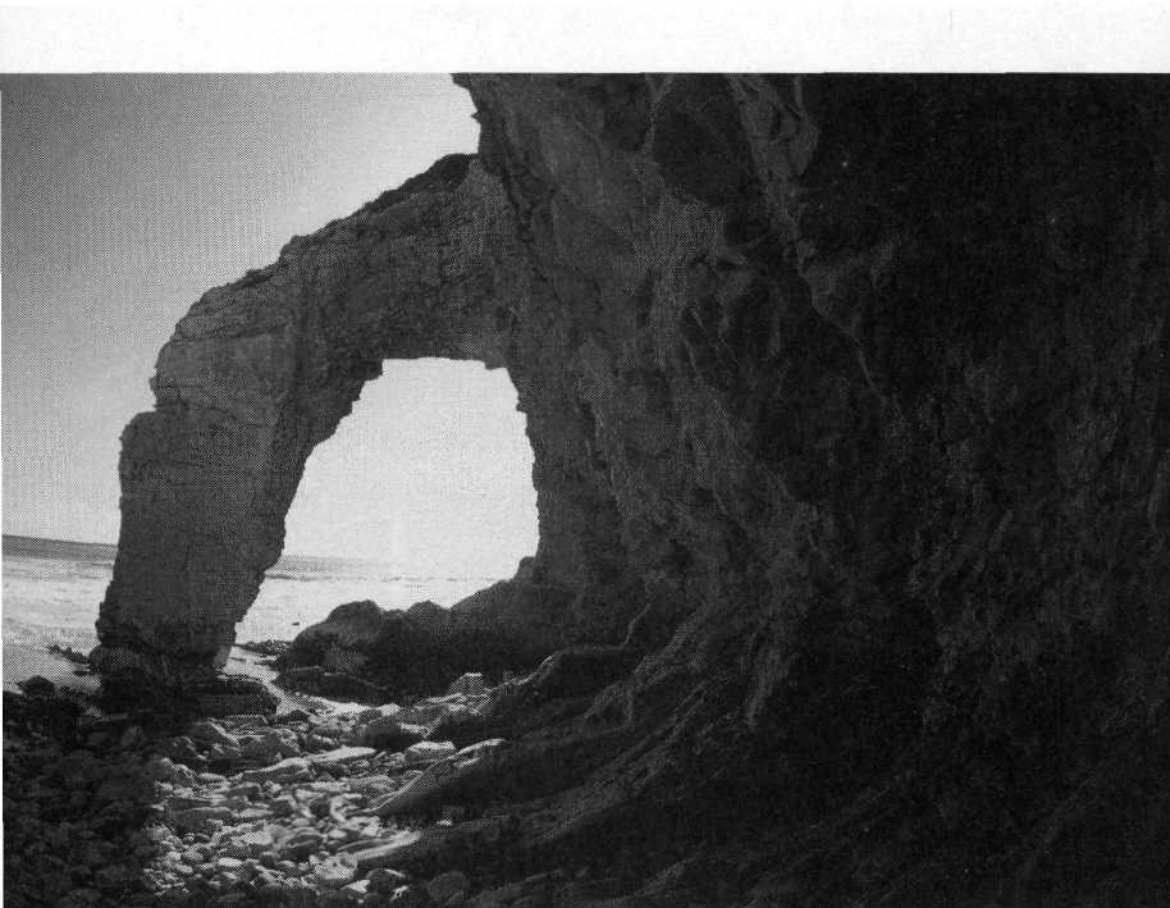
Top left: Exposing for the late-sunset sky gives texture to the sky and records the arch in silhouette.

Top right: Combining sunlit and shaded areas is a great way to produce a dramatic effect, but such scenes stretch the latitude limits of the film. It's best to expose for the highlight areas in sunlight/shadow scenes. Bracketing exposures is also a good idea.

Above: Using the arch to block sunlight coming from directly in front of the camera and shooting with a full-frame fisheye lens produces a dramatic shot with detail throughout.

Left: An extreme wide-angle image at sunset records detail in the sky and a silhouette of the backlit arch. You can get a lot of variety in outdoor shots by moving around the subject and shooting throughout the day.

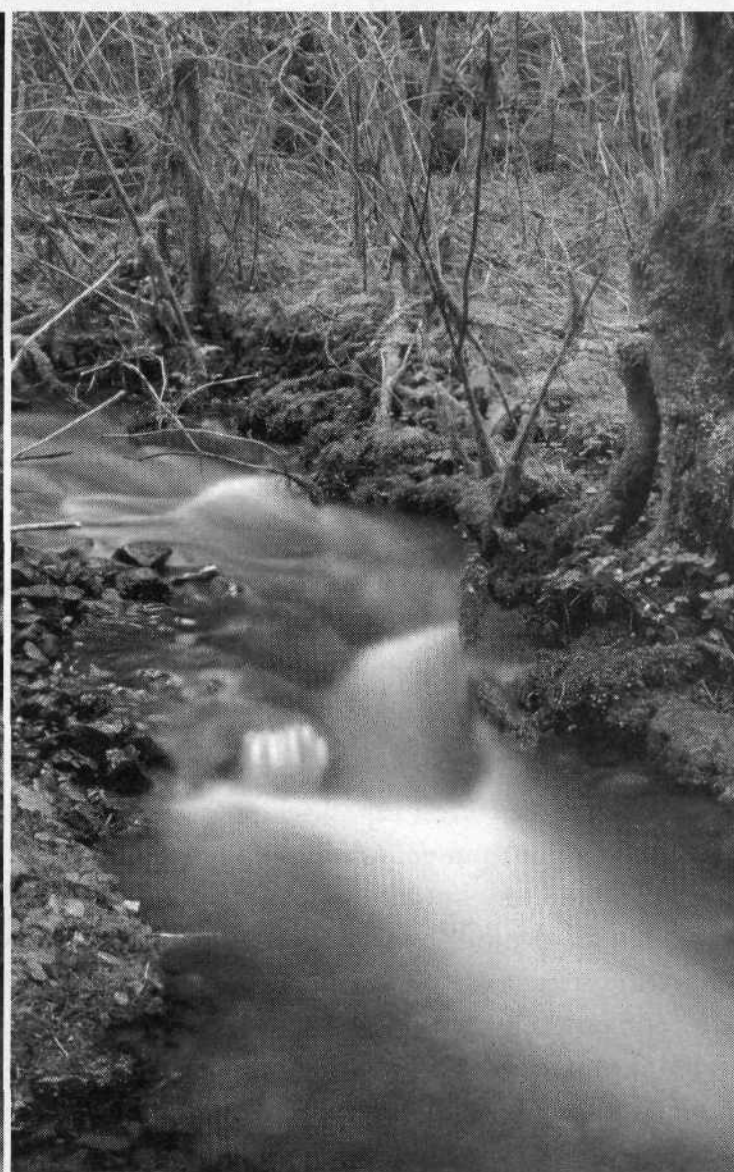




Fog is unique in that it gives great depth to an image if you have a subject close and one in the distance. If you have a very saturated color subject in the foreground, you can get some pretty dynamic images. Metering is a little bit of a problem, since most meters will underexpose fog images. If you have a spot meter, or meter lock, point the camera at an object that has an 18% gray surface. The light levels may even be lower than heavy overcast, so a tripod, fast lenses, and high-speed film may be necessary. If you happen to get the sun bursting through the

fog, we would highly recommend bracketing your exposures even if you use color negative film.

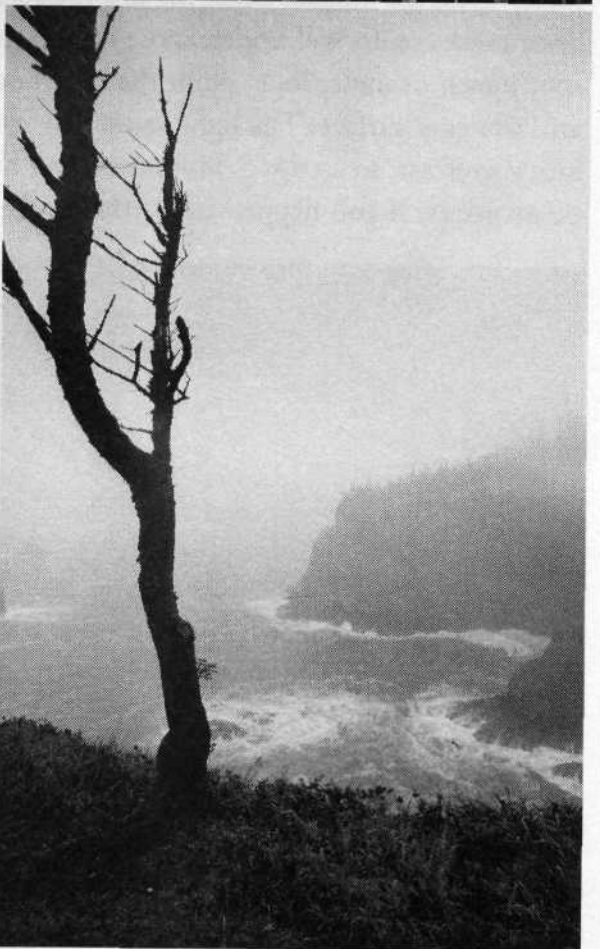
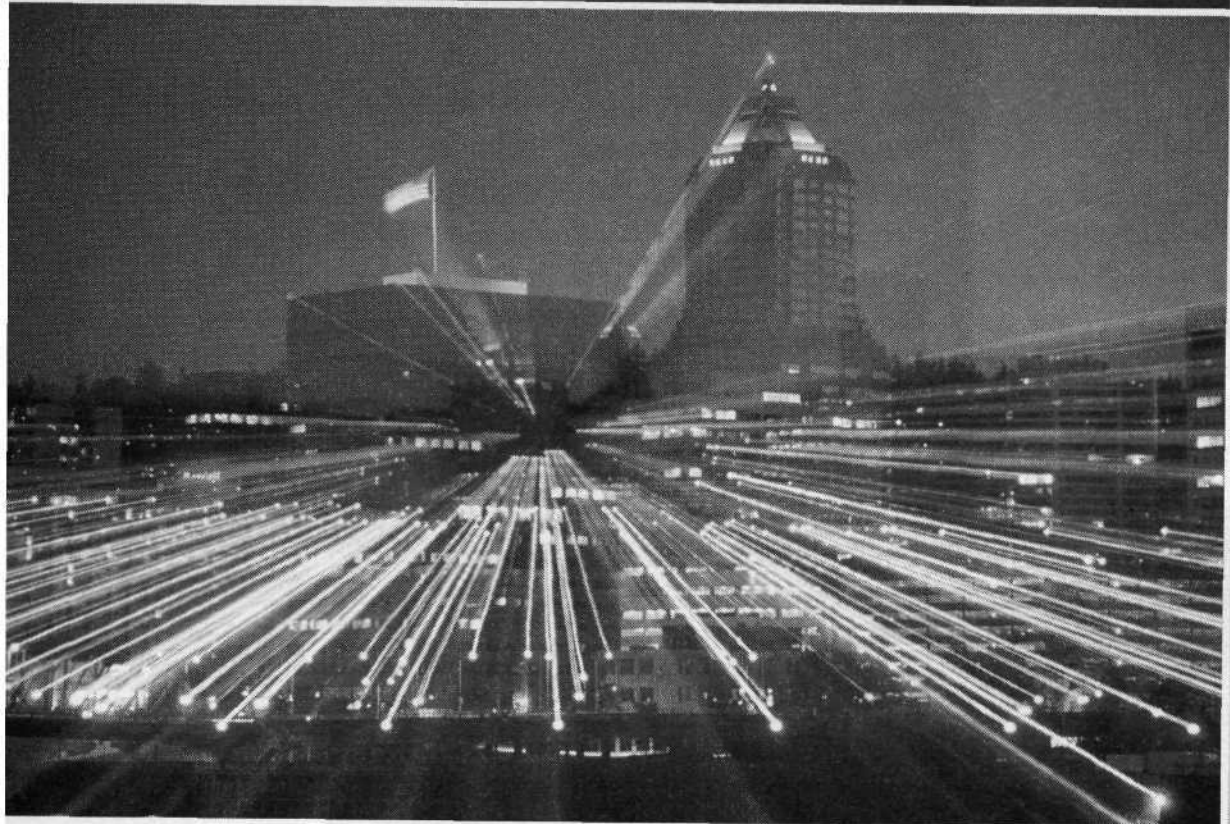
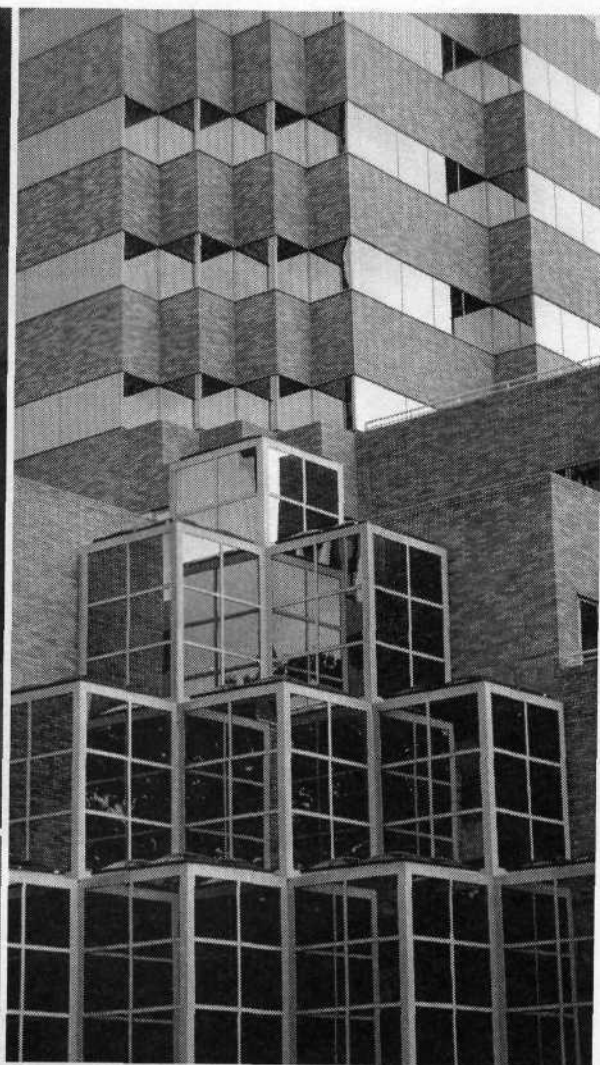
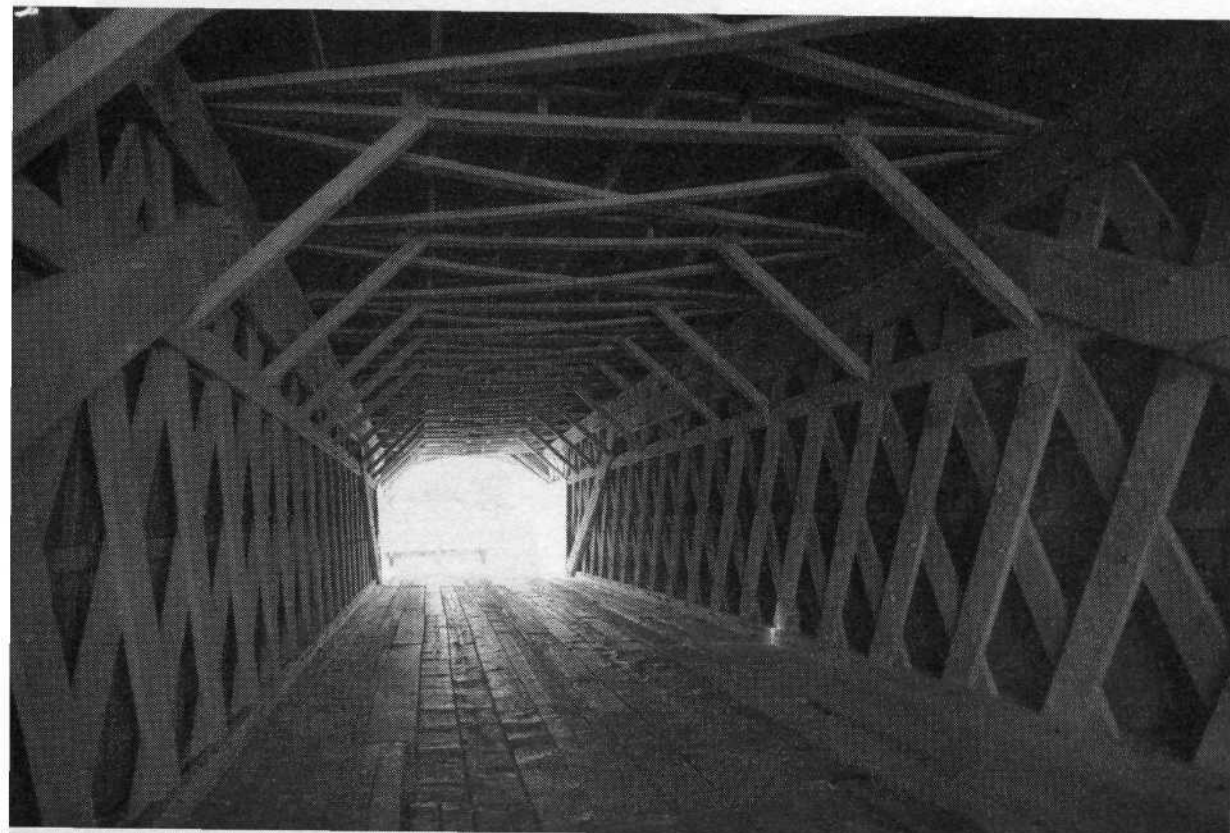
Most people think that sunsets are difficult. The truth is that they are some of the easiest images to capture. When the sun sits low on the horizon and takes on an orange look, you can use center weighted or multi-segment metering and get great shots. If you bracket your images with three shots, you will get three great-looking sunset shots since the exposure latitudes with sunsets are more forgiving than with other



Top left and right: Switching from horizontal to vertical format is a great way to get variety in your shots. But it may also affect the exposure reading from your camera's built-in meter. When in doubt, bracket.

Far left: Deep shade requires the lens to be wide open to provide a sufficiently fast shutter speed to record the moving water realistically. Near left: Stopping the lens all the way down requires a much longer shutter speed, blurring the water. A multi-segment meter was used to determine the exposure for both photos.





Top left: Since most of this image consists of the interior of the covered bridge, it was exposed for that, rather than for the small sunlit opening at the end.

Above: The photographer zoomed the zoom lens during the long exposure time made possible by the dim night lighting to produce this effect.

Top right: Overcast sky produced weak sidelighting that allowed for fine detail in both highlights and shadows, but still produced a lighting ratio.

Bottom right: Heavy fog with a subject in the foreground area gave a feeling of depth due to the contrast change—closer subjects have more contrast, more-distant subjects have less contrast.

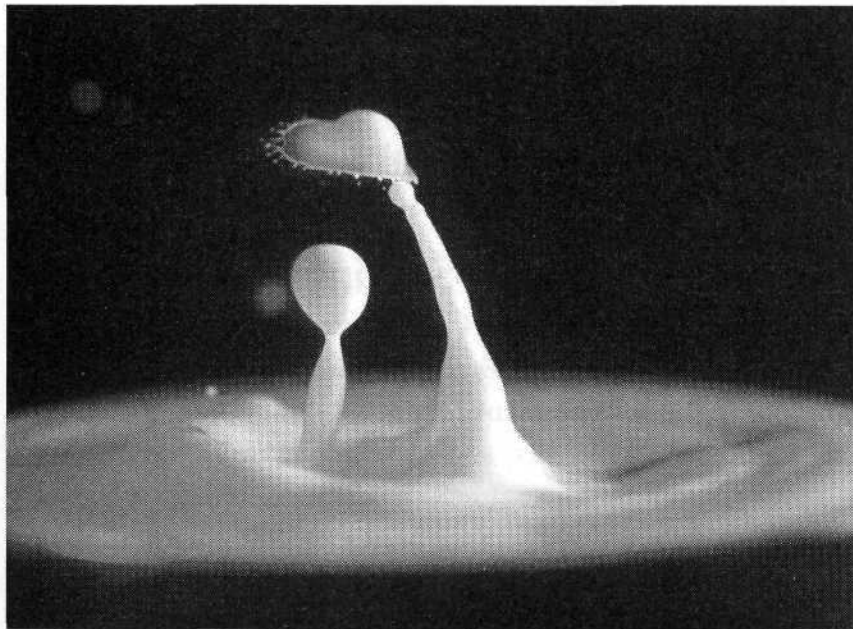
subjects. Each image will have a little different hue, but it is totally judgmental as to which is the correct exposure.

So, now the sun has set, but don't put your camera away yet. You can use twilight to take some very interesting images with long exposures. This will require the use of a tripod and cable release. When your exposures start to extend beyond ten seconds, film sensitivity and exposure are not always what your meter indicates. This problem is called reciprocity failure. You can write to the film manufacturer (or check its website, if you're connected to the Internet) to learn just how long to

adjust your exposure to compensate for reciprocity. With these long exposures you can shoot the afterglow of the sun behind the city lights, or a silhouette of a tree against an orange glow. One of the most unusual effects is when you take pictures of the waves crashing on the beach. With these long exposures the ocean turns into a lake of fog.

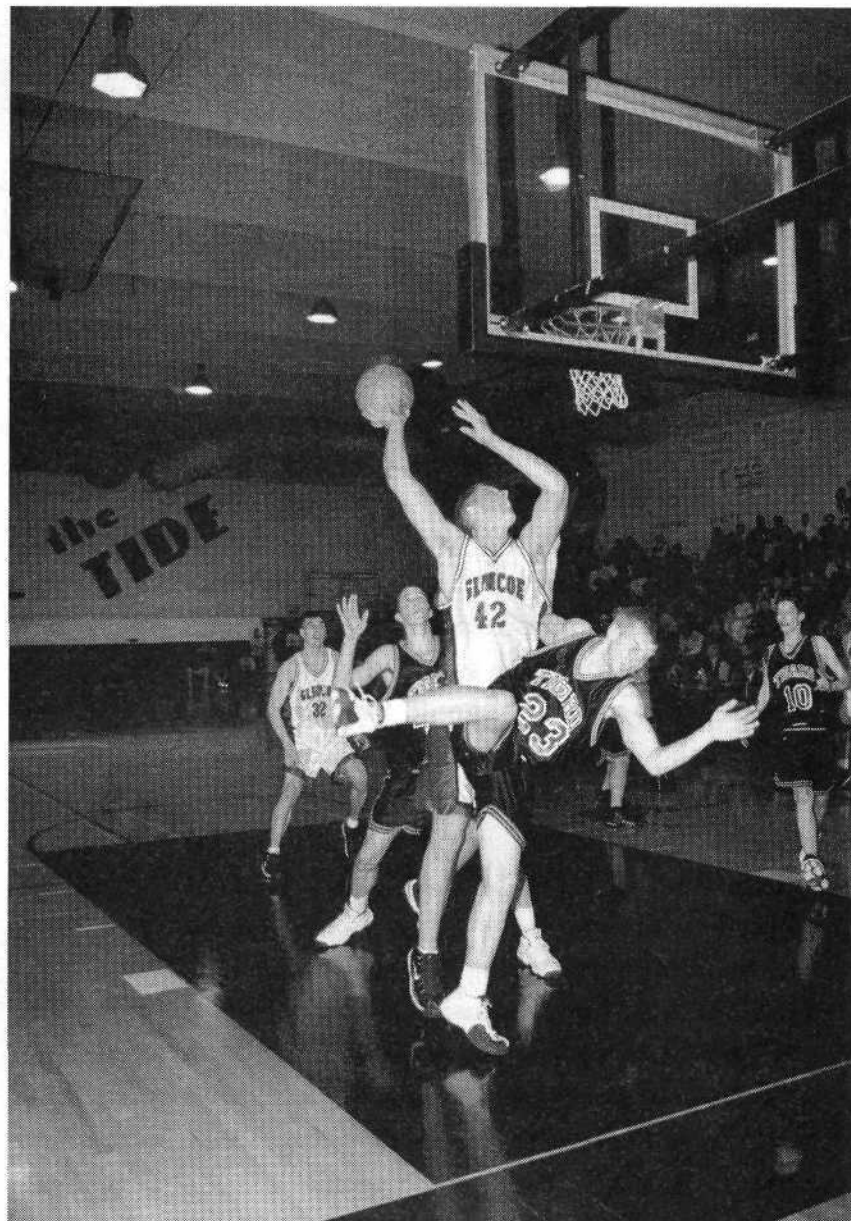
When we have been using sunlight as our main light source, we had to move our subject to achieve proper lighting. Now we will show you how with artificial lighting, you move the lights around your subject to achieve the desired effect.





Above: The very brief duration of a electronic flash burst can freeze moments in very rapid motion. Here, a flash unit used at very close range produced a duration of  $\frac{1}{40,000}$  second—brief enough to freeze two milk drops hitting each other.

Right: Even at greater shooting distances, electronic flash is great for action shooting. On-camera flash was used with high-speed color-negative press film for this shot.



## Electronic Flash

Electronic flash is the most popular artificial source of photographic lighting. The color balance of electronic flashes today are designed to closely match the color quality of sunlight. This is called Kelvin temperature. The sun and most flash units are about 5600 K. The sun is like a light bulb, so it has a 360° angle of light from its source. Some professional flash units have an open flash function that allows it to operate much like the sun. Most electronic flash units have a restricted beam angle so they have a limited area the light can cover. Although electronic flash units vary, most will cover up to the field of view of a 24mm lens without using a diffuser.

## Direct Flash

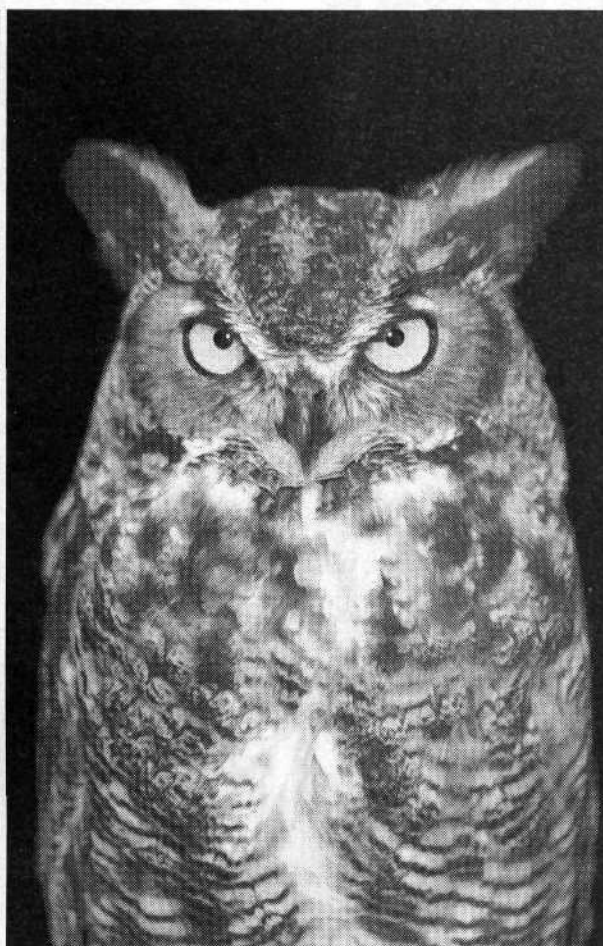
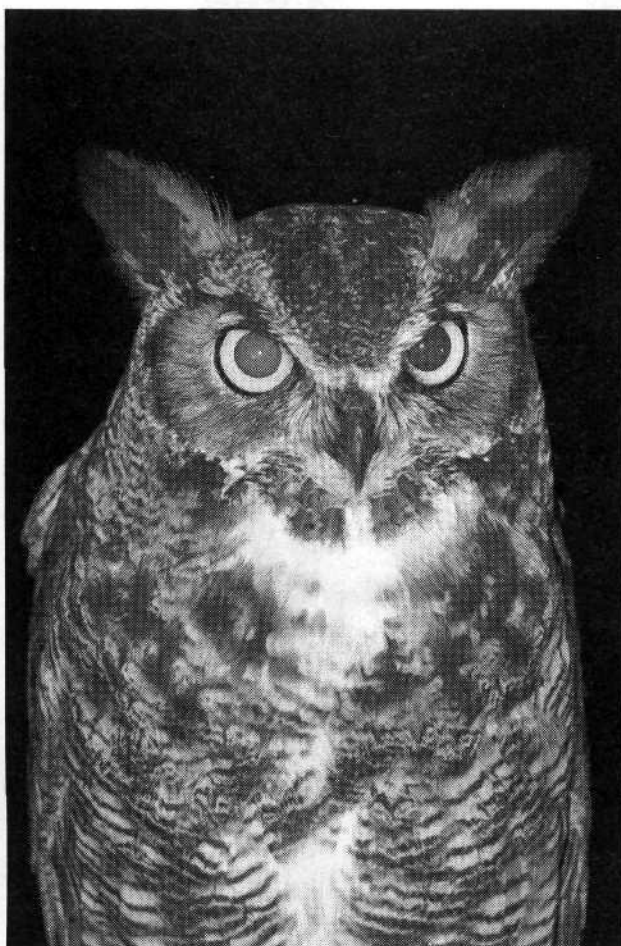
Portraits taken with a built-in flash, or one attached directly on top of the camera, seem to be what most people produce. That's a shame, because this on-camera flash produces harsh shadows behind your subject, little feeling of depth and often

causes red-eye. You can eliminate the shadow by moving your model further away from the wall or by raising the flash unit so that the shadow is cast down behind you subject. By raising the flash, you will gain a bit more depth to the photo.

## Red-Eye

A few words about red-eye. It is caused when the flash is too close to the camera lens and the subject's pupils are large because of low room light. When the flash goes off, it lights the back of the eye which reflects back to the camera. This is very similar to a

Red-eye occurs because the flash is too close to the lens axis. Cameras with built-in flash have red-eye-reduction modes that fire preflashes to "stop-down" the subject's eyes beforehand.





cat's eyes at night when a light hits them. Since point-and-shoot cameras have their flash very close to the lens, they often have a red-eye-reduction function which fires a short burst of light towards the subject before the picture is taken. This causes the subject's pupils to close down by the time the picture is taken. For cameras with detachable flash units, the solution is to move the flash a short distance from the camera via an extension sync cord. If you can hold the flash unit at arm's length, you will pretty much get rid of red-eye.

## Portraiture 101

A better method is to move the flash 45° to the side of your subject and 45° above your model. You can add a source of fill light, like a reflector or white card, positioned next to the camera on the opposite side of the flash. This will create a nice direct side light and a soft fill light in the shadow area. Remember that a portrait should look like you only used one light, so make sure your fill light doesn't cast a second shadow on your model's face.

## Bounce Flash

You can also expand the angle of coverage with an electronic flash by bouncing the light—aiming the flash unit at a reflecting surface, and using the reflected flash light to illuminate the subject. It usually is done by bouncing the light off an umbrella reflector, another reflector or white card. The results is a soft, diffused lighting that is very flattering for portraits.

If you don't have access to an umbrella reflector, you can bounce the light off the ceiling or a wall. This accomplishes the same end effect. You need to be careful when choosing your ceiling or wall. A white wall works great, but if it is a

colored wall, your photo will take on the same color cast. A light bounced into a white wall will produce a nice side light if you place your subject properly. A ceiling light bounce will often produce too flat a lighting, but it works well in conjunction with an on-camera flash.

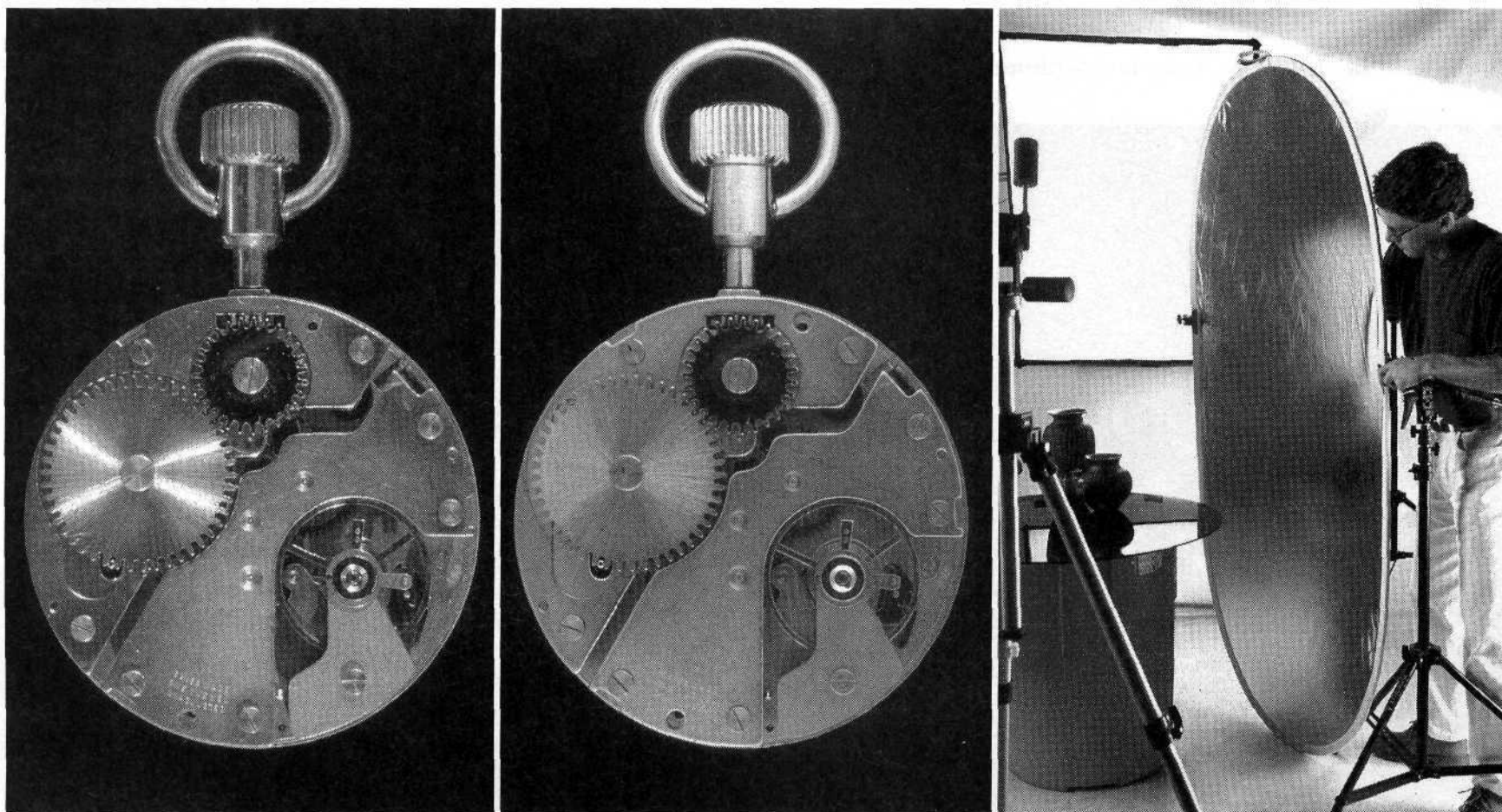
## Flash Settings

Before through-the lens (TTL) cameras came upon the scene, most flash units had manual and auto settings on the back of the unit. The manual function usually set the flash at full power, half power, and quarter power. The auto function was a sensor mounted in or under the flash head that sensed the light reflecting back from the scene. The auto function worked well as long as the subject filled the scene and was not too dark or light in reflectance.

Today most flash systems take advantage of the meter systems inside the camera. This means that your flash must be dedicated to the type of camera you are using. In other words a Nikon flash for a Nikon camera, or a third-party flash systems designed for a specific camera. The flash is metered through the camera lens, giving a much better reading than with the previous auto sensors. Most flashes today still have the auto and manual settings for those creative situations where you want to bypass the TTL functions.

You can also use the flash on your camera as a fill-flash to remove shadows created from the sun behind your subject. It is easy to accomplish since today's sophisticated SLR cameras automatically balance the ambient light and flash. Even the compact point-and-shoot cameras have an automatic flash-fill function.

The electronic flashes today offer a variety of controls to



Left: Direct lighting creates hot spots on metallic subject.

Center: Soft lighting, produced by bouncing the flash off a large umbrella-shaped reflector, reduces the hot spots.

Right: Reflectors are very handy items. You can bounce the main light off one to soften it, or use a reflector to bounce light from the main light onto the shadow side of the subject (as shown here) to decrease the lighting ratio.



make them effective lighting tools. Some systems provide exposure compensation, so you can make the flash weaker or stronger than the sunlight. The angle of the flash head can be adjusted to match the angle of the lens, and an f-stop/distance indicator on the back tells you the working range of your flash based on the film you using. In addition they give you instant readouts of your f-stop setting, shutter speed, focal length and even time of day.

You can connect several flashes together with special flash cords, or via cordless TTL flash slaves. With two or three small TTL flash units, you will have a very portable lighting system that can provide very professional results. Remember when you set up slave flash units, their exposure compensation should be less than the key flash, or have them a greater distance away from the subject.

## Slow-Sync Flash

With slow-sync flash, you combine a slow shutter speed with the very brief flash duration. The advantage here is that you can

expose for a low-light situation and correctly light a subject close to the camera with flash. For example: if you wanted to take a flash picture of someone with the lights of the city in the background, you would set your camera on a tripod and set slow-sync flash. The flash will correctly expose the subject in the foreground, while the long shutter speed records detail in the city lights.

With most cameras, the flash fires at the beginning of the exposure. If you make a long exposure of a subject moving across the frame with this normal front-curtain sync, the flash records the subject at it starting position, then the ambient light records a ghost-image "speed streak" as the subject moves across the frame. The result is a photo with a "streak" in front of the moving subject—an unnatural effect. A special function on many of the more sophisticated flash units today is called rear-curtain sync. Also known as second-curtain sync, this function fires the flash at the end of

the exposure instead of at the beginning. Thus, the streak is recorded as the subject moves across the frame, then the flash fires to sharply record the subject at its final position in the frame. The result is a photo of the subject with a speed streak behind it—a more natural effect.

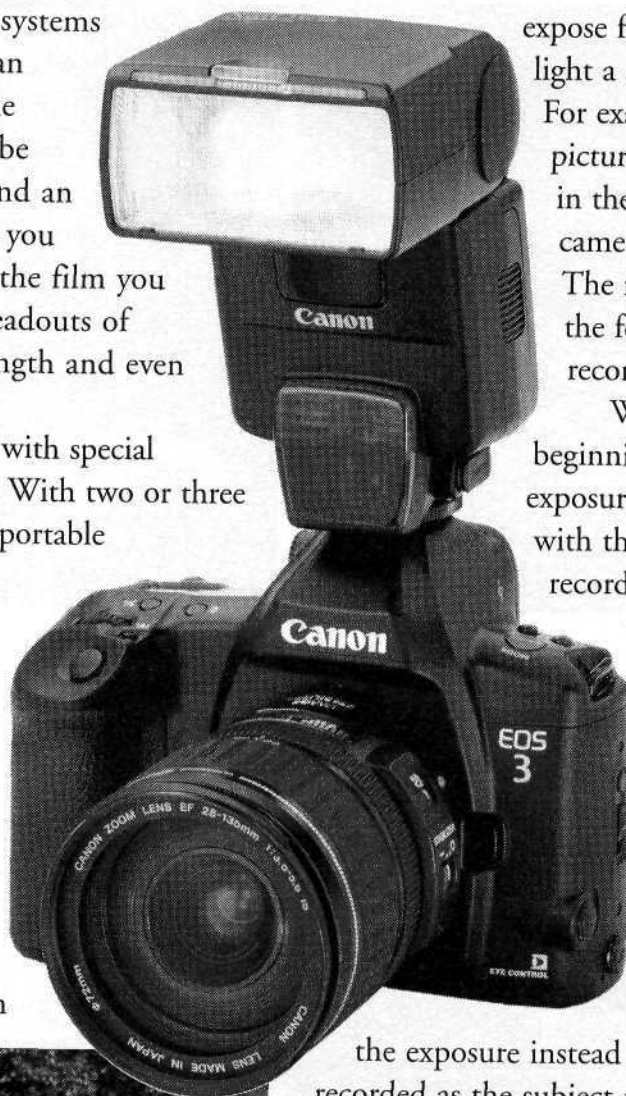
## Stroboscopic Flash

Another fancy function found on many flash units is a stroboscopic flash setting. When the camera fires at a long shutter speed, the flash will fire rapidly several times as a subject moves through the scene. The result is multiple images of the same subject passing by a stationary background, all recorded on a single frame of film.

## Tungsten Lights

Taking photographs under tungsten lights requires a couple of changes to your camera system. If you are shooting black-and-white film, you should increase your exposure by the amount indicated on the technical sheet for that film. There are special tungsten-balanced slide and color negative films on the market, which do not require extra filtration or exposure. If you use daylight-balanced color slide film under tungsten lights, the results will be too red. A special 80A color conversion filter will convert the light source to daylight color so that it matches the daylight film in your camera. Remember to increase exposure to compensate for the light absorbed by the filter—the filter and film instruction sheets will tell you how much (usually 1½ stops).

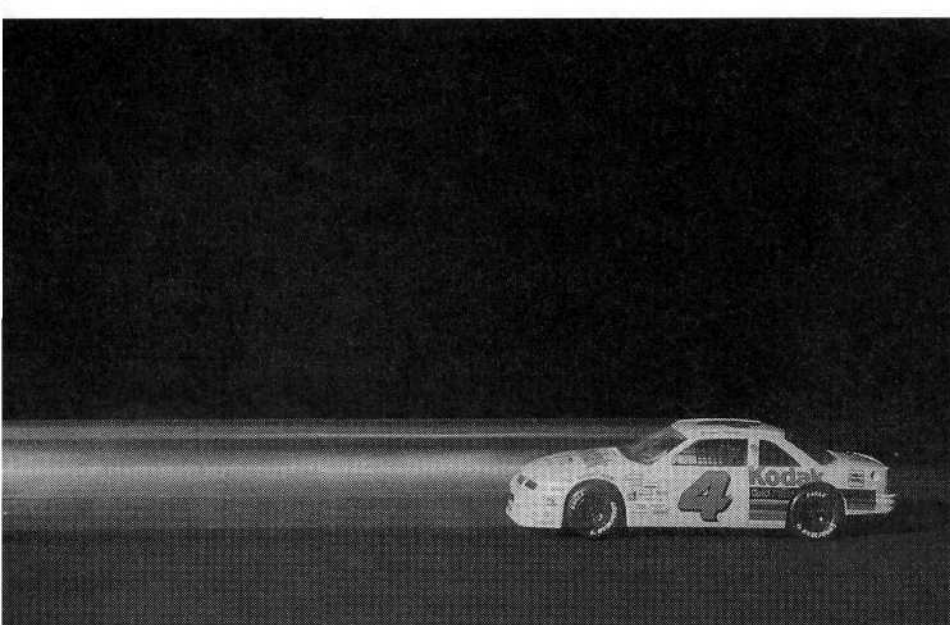
If you like working with tungsten lighting, you can set up a studio lighting system with a set of hot lights. Several manufacturers make these very bright studio lights that get very hot, but do show you the exact lighting you will get in each shot. Most have special color gels, barndoors, and all accessories needed to provide professional lighting setups.



Top: Dedicated shoe-mount flash units are very versatile accessories. They provide a handy source of light whenever you need it, they provide more power than built-in flash units, with many cameras they'll provide automatic balance of flash and ambient-light exposures, and they add such features as rear-curtain sync, strobe effect and bounce/tilt capability.

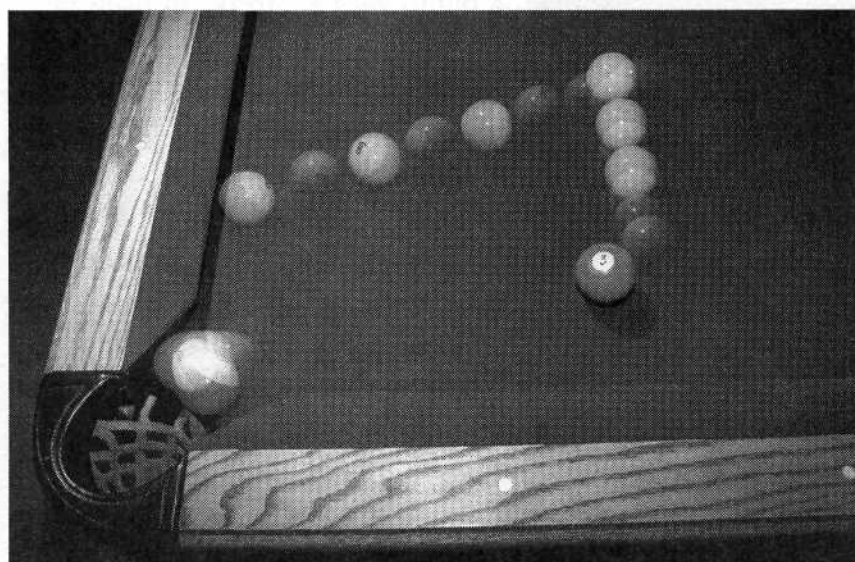
Middle: Direct sunlight produces unattractive harsh shadows.  
Bottom: Fill-flash lightens the shadows for a more-pleasing effect.



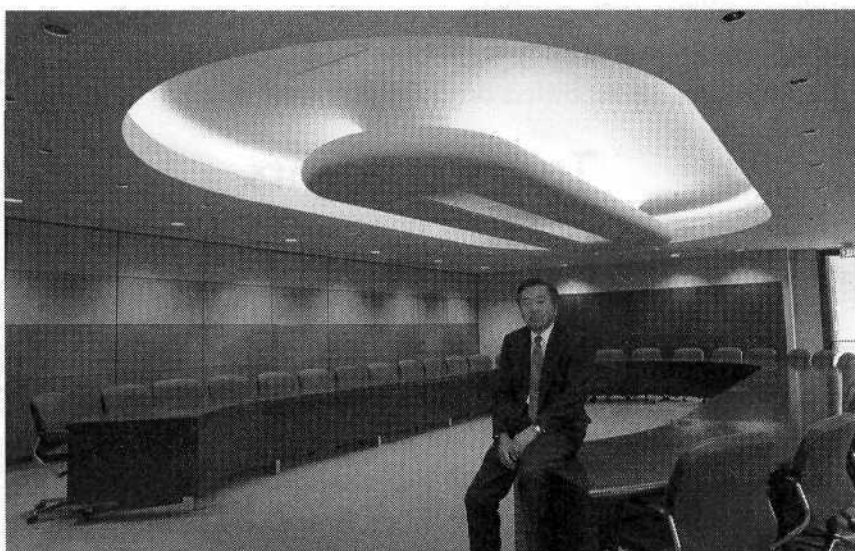


Above left: With front-curtain sync, ghost-image speed streaks appear in front of the subject.

Above right: With rear-curtain sync, the speed streaks appear behind the subject—a more-natural effect.



Above: Strobe-effect mode first the flash several times in rapid succession, allowing you to record a moving subject in several positions on a single frame of film.



A small flash was used to add light to the face in this otherwise existing-light environmental portrait. When shooting color in mixed lighting, use color-print film rather than slide film.

## Fluorescent Lights

Of all the types of lighting in the world, the most unpredictable is the fluorescent light. If you're shooting black-and-white, you should be all right if you just add additional exposure. If you shoot color film, then you're in for trouble. The problem is there are more than 40 different

types of fluorescent tubes and each produces a different color variation. There is no color correction filter that can solve all the fluorescent light problems. You will find one bulb to be bluish, another yellow, most will be green, and a couple produce red hues. The best bet is to use daylight-balanced film and just start trying filters. Most film data sheets will give you a couple of recommendations for correcting certain types of lights, but they give no guarantees. If you want a starting point for color filtration, we recommend using a 30 magenta filter. It may not completely correct the whole image but will get you close for most types of bulbs. Also, several filter manufacturers offer special fluorescent-light filters, such as the FL-D for use with daylight film, which do a good job of compensating for the odd colors of fluorescent lighting.

## Window Light

The light filtering in through windows serves to provide nice soft lighting for portraits. The larger the window, the wider the light beam coming through it, and the softer the light. North-facing windows are the best as they are only exposed to light from the sky. You will find that the light coming through the windows is not very bright, so you will probably need to use a tripod or high speed film.

## Painting with Light

Painting with light really describes how you use the light. The reason you would try this is because sometimes you will have a scene that is too large to be lit with one or even two lights. The light source can be a flash, tungsten, or even a fluorescent light. The idea is to mount your camera on a tripod and lock the camera shutter open using a cable release. Make sure no lights are shining on the subject. Start moving the light around the subject, "painting" it with light. You should try to keep the light the same distance from the subject, unless you want more light on one side than another. You can actually walk through the scene being photographed as long as you have dark clothes on, and you don't point the light at yourself. You will need to bracket the time you paint with light, and even the f-stop you use.

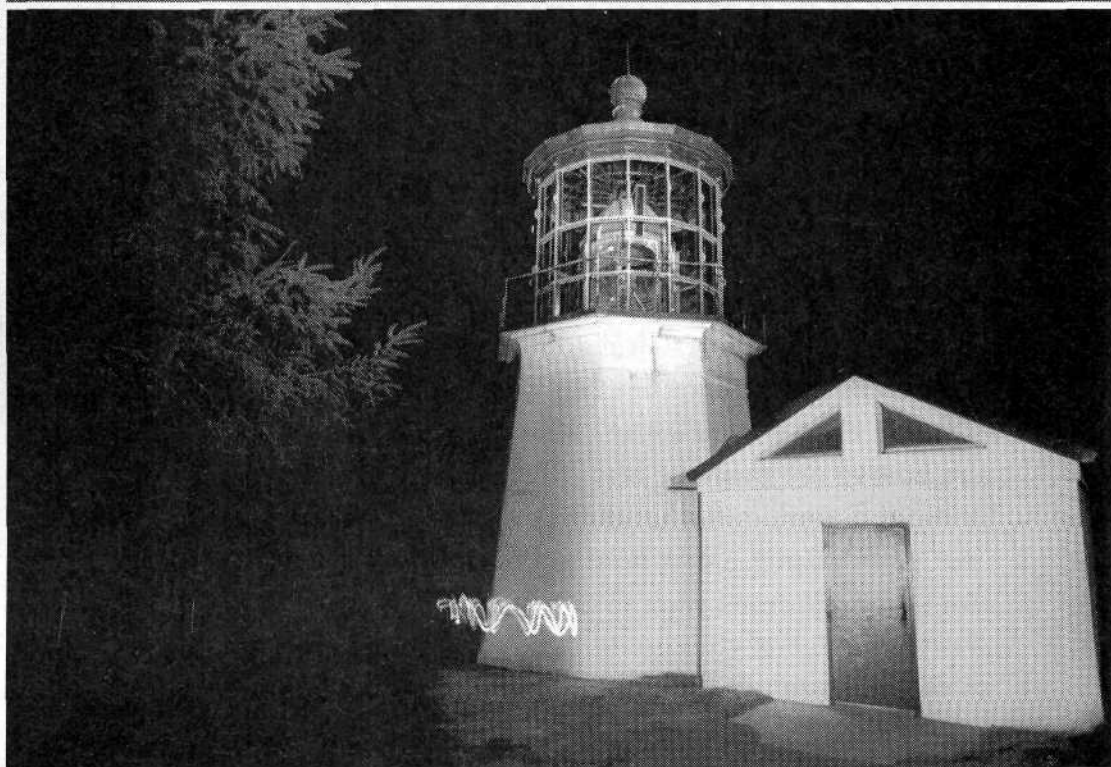




Above: Window light can be a great light source for portraits. Exposure was based on a spot-meter reading of the mother's cheek.

Top right: When shooting in mixed lighting (here, overcast outdoor light plus tungsten light inside the hangar), use color-print film rather than slide film for best results.

Bottom right: You can illuminate a large subject with a single flash unit by painting it with light (see text for details).



Painting with electronic flash is done the same way except that you place the flash on manual power and press the fire button as you move around the subject. You can be in the scene when you do this, but there is more of a chance that part of you will show up in the picture. Sometimes the photographer purposely puts him- or herself in the scene several times. A variation of this technique is to use different colored gels over the light sources as you paint the scene.

## Mixed Lighting

If you want a lighting challenge, then try your luck at a mixed lighting situation. It could be flash and tungsten, flash and fluorescent, tungsten and fluorescent, or sunlight and one of the man-made light sources. This may sound like an impossible task, but there are ways around the problem. You just have to thoroughly think it through. Let's say that you're photographing in a room with fluorescent lights and you have an electronic flash on your camera. The two givens are that the fluorescent light can't be changed and you have daylight film in your camera. Put a 30 magenta filter on the camera lens to correct the

fluorescent light to daylight film. Then put the opposite filter over the flash head (30 green) so that it matches the fluorescent lights. Confused yet? Each combination of lights would have a different solution, so you just have to logically think it through.

## Final Thoughts

There is so much more to lighting. We have just touched on a few of the main concepts. For those point-and-shoot camera fans, your flash tasks are even easier. With most of these cameras, you can select flash on, flash-fill, red-eye flash, automatic, and no flash. If you leave it on automatic, the camera will decide if there is enough light for the whole scene, or even turn on and fill the shadows if there is not enough light falling on your subject.

The main thing to remember is that lighting is one of the creative parts of photography. Continually experiment so that you understand it better. Don't be afraid to break the rules. Use light like a painter uses paints on a canvas. Once you do, you will discover a whole new world you never saw before. So, now go capture it on film. ■